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OBSERVATION ON THE SHIFT OF THE ARNETH NUCLEAR CONFIGURATION INDEX IN OXALATED VENOUS BLOOD

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Osgood, et al, (1) have proposed a method for making differential blood counts with oxalated blood, emphasizing that the sooner the smear is made the more dependable the differential enumeration. These observers found that gross inaccuracies were rarely encountered if the smear was made within three hours after the blood was oxalated. If through inaccurate technic, however, an excess of oxalate is used, they observed that nuclei of the polymorphonuclear leukocytes lost their lobulated form and became spherical. In a later publication Osgood (2) fixed the maximum time limit for the procedure as one hour.

It is the purpose of this paper to cite our experience with Osgood's method of using oxalated blood for enumeration of blood cells, which indicates that morphologic changes in the leukocytes may develop very rapidly after the anti-coagulant is added.

A change of the nuclear configuration has been observed within a period of 15 minutes. This change is characterized by hyperpolymorphosis and is so marked that an Arneth or Schilling Index deviates from the finger-blood specimen taken at the same time to such a degree that an evaluation of the index would be misleading.

Probably the above phenomenon has been observed by others when making routine hematological studies on oxalated venous

blood. The extent of the hyperpolymorphosis may not be detected, however, unless finger blood is used as a control.

A study resulting from a casual request for an Arneth-Schilling Index on an oxalated venous blood specimen attracted our attention initially. The specimen submitted had been drawn about one hour previously. According to Osgood no gross inaccuracies should occur up to one hour. When a stained smear of the submitted specimen was examined an unusual picture was found. The segmented neutrophils dominated the pattern. A right shift instead of an expected left shift was believed to be bizarre since it was reported at the time that the patient had a severe systemic infection.

Artifacts were suspected; hence, a preparation was made from the patient's finger blood, which showed that a severe left shift was actually present (figure 1). It appeared then that hyperpolymorphosis, as illustrated in figure 2, was the result of morphologic changes in the oxalated specimen. It will be observed that the same number of neutrophils are present in both figures 1 and 2; thus, one cannot escape an impression that the extreme change of the nuclear configuration was produced in vitro.

Normal blood oxalated and used as a control showed also that the eosinophils, basophils and monocytes undergo nuclear karyorrhexis. Following this observation an informative experiment was planned in order to determine the degree of nuclear deviation in blood from a case of pneumonia showing a severe left shift. An oxalate bottle was made up according to the method described by Osgood.* A 5 cc. sample of venous blood was obtained and thoroughly mixed with the dry potassium oxalate. Immediately a smear was made from the oxalated blood and simultaneously finger blood from the patient was taken. Specimen preparations were made every fifteen minutes thereafter from the oxalated blood until the end of an hour. The specimen was held at room temperature and was well mixed each time to insure proper redistribution of the leukocytic elements.

The Arneth Index was determined on all preparations within the usable area (3) averaging 400 cells for each slide. The data obtained are given in table 1.

Discussion

As time elapses hyperpolymorphosis becomes more and more

* Potassium oxalate 2% solution was freshly made up. One-half cubic centimeter was placed in a chemically clean bottle and evaporated to dryness in a drying oven.

progressive. In this particular case, Class I neutrophils showed a reduction of 20 per cent at the end of one hour.

On the basis of these findings only one conclusion can be reached —oxalated venous blood is not suitable for differential counts unless the smear is made immediately after the blood is withdrawn and mixed with the anticoagulant.

TABLE 1

Shift of the Arneth Nuclear Configuration Index in Oxalated Venous Blood immediately and every 15 minutes up to one hour.

Arneth's Nuclear Classification	I	II	III	IV	V	VI	VII	VIII
Normal Arneth Index in Percent	5	35	41	17	2			
Control Finger-blood	32	43	22	3				
Venous Blood Oxalate Immediately	31	44	21	3	1			
Same 15 minutes	23	38	25	9	4	1		
Same 30 minutes	21	32	20	16	8	2	1	
Same 45 minutes	15	30	22	15	10	5	2	1
Same 60 minutes	12	19	18	25	15	6	3	2

Summary

1. A shift of the nuclear configuration of the polymorphonuclear leukocyte occurs when the elements are exposed to potassium oxalate.

2. The phenomenon may lead to misinterpretation of the leukocytic pattern, since it occurs almost immediately and is marked within 15 minutes.

3. The degree of nuclear deviation from that of the control increases with the exposure time.

4. That "no gross inaccuracies" occur up to one hour could not be supported by the above observations.

5. The use of a fresh specimen of finger blood for differential counts seems to be the best method.

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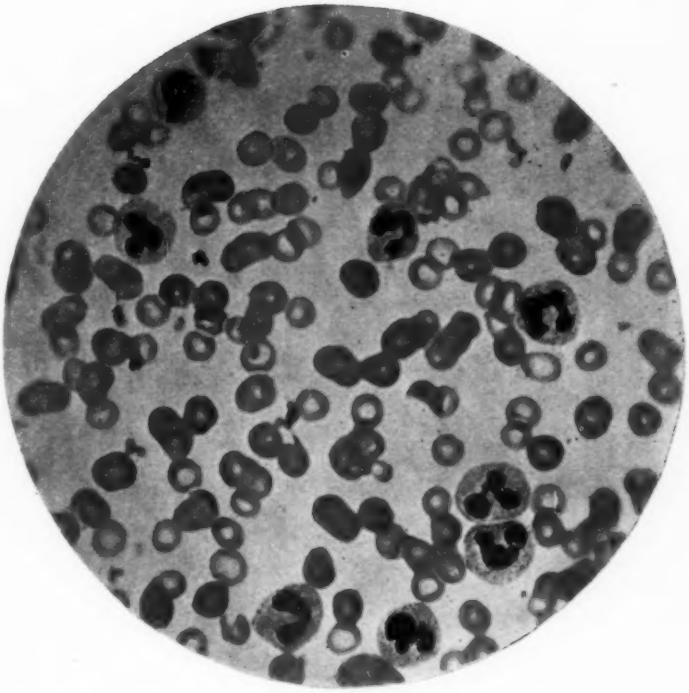

FIGURE 1

Finger Blood Control: Arneth's Classes I and II Constitute the Dominant Neutrophil Pattern.

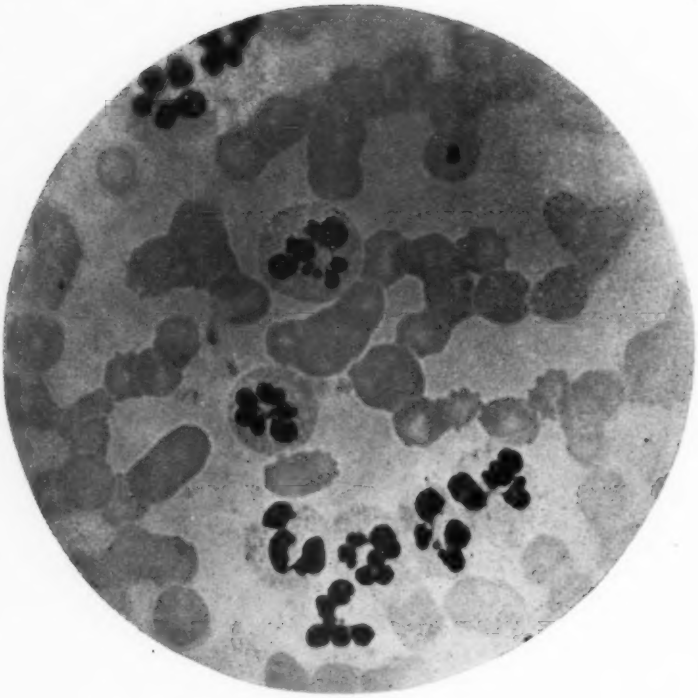

FIGURE 2

Oxalated Venous Blood after one hour: Arneth's Classes IV to VIII Constitute the Dominant Neutrophil Pattern.

DIOXAN IN TISSUE TECHNIC

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The use of dioxan has simplified the preparation of tissue sections by the paraffin method enough to warrant its widespread adoption. It is relatively inexpensive in comparison with absolute ethyl alcohol or aniline oil. It mixes readily with water, alcohols, chloroform, xylene, benzene and oils. It is readily dehydrated with anhydrous calcium chloride, calcium oxide, anhydrous copper sulphate or preparations as "Drierite." It dissolves paraffin only very slightly at room temperature or at 37 degrees Centigrade; above 45 degrees C. solubility increases rapidly to the melting point of the paraffin used. Dioxan and melted paraffin are miscible in all proportions while kept at the paraffin melting point.

Dioxan boils at 101 degrees C. For this reason it does not evaporate quickly from a paraffin bath kept at 56 degrees C. When melted paraffin containing more than four or five percent of dioxan is allowed to cool, it does not harden smoothly and solidly but forms a soft crystalline mass. Consequently, tissues transferred from dioxan directly into a small amount of paraffin in an oven regulated to 56 degrees C. must be left in this paraffin bath for about six hours or longer in order to allow the dioxan enough time to vaporize. This prolonged heating apparently does no harm to most tissues but does delay the embedding process. Transferring the tissue from dioxan to a saturated solution of paraffin in dioxan and then to the paraffin bath does not speed up or in any other way improve the process. A few tissues, especially those containing portions of skin, are more difficult to section after prolonged heating at 56 degrees C. On the other hand, when tissues are transferred from dioxan to a small amount of paraffin at 56 degrees C. and allowed to remain in this melted paraffin for only an hour or two, the tissues are infiltrated with paraffin containing a fairly large amount of residual dioxan which has not had time to evaporate from the paraffin bath. And so, even if these poorly infiltrated tissues are surrounded by dioxan-free paraffin in the embedding process, the paraffin that they are infiltrated with contains so much dioxan that after cooling the block of tissue does not cut well and tends to pull out of the paraffin in which it is embedded.

I have found that the following procedure greatly shortens the

time required for paraffin infiltration: tissues are taken directly from dioxan at room temperature and dropped into a comparatively large amount (about 150 cc.) of melted paraffin kept at 56 degrees C. in the paraffin oven. This melted paraffin may be kept in 200 cc. beakers nearly filled; not more than four small blocks of tissue are placed in each beaker. By using a large amount of melted paraffin in the infiltration process, the dioxan contained in the tissue is so highly diluted that it is not necessary to allow time for it to vaporize from solution. By following this rule, blocks of tissue one millimeter thick are quickly infiltrated with paraffin; the tissues may be embedded after thirty minutes in the paraffin bath. Blocks of tissue 2 mm. thick should be infiltrated one hour. In the embedding process, surround the tissue with dioxan-free paraffin that has not been used for infiltration.

After repeated use, dioxan tends to accumulate in paraffin kept at 56 degrees C. After the beakers of paraffin have been used once for infiltration, pour the paraffin in them into a larger beaker or pan; heat it on an electric hot-plate to 150 degrees C. to drive off the accumulated dioxan. Dioxan is inflammable and its fumes are poisonous; this should be done in a well ventilated room or under a fume hood. Paraffin thus purified may be used indefinitely; it should be filtered frequently in the paraffin oven. Paraffin containing rubber or beeswax, or both, is preferable to ordinary paraffin. This laboratory uses Fisher "Tissuemat."

It is possible to infiltrate tissues and remove dioxan successfully by passing them through two or more changes of paraffin at 56 degrees C. However, this requires more time and offers no advantage over the method proposed. Nor does passing the tissues from dioxan into chloroform or benzene and then into paraffin offer any distinct advantage.

Two rules that aid in the production of uniformly good tissue sections are: keep your dioxan water-free and your paraffin dioxan-free. Dioxan is usually dehydrated with anhydrous calcium chloride. It is not necessary to place tissues and calcium chloride in the same jar. After being used once to dehydrate tissues, the dioxan with its adsorbed water may be filtered into a bottle containing calcium chloride. After remaining in contact with the dehydrating agent for twelve hours or longer, the dioxan may be poured back into the tissue-dehydrating jar and used again. If tissues and calcium chloride are kept in the same jar of dioxan, they should be kept separate by filter paper or a perforated partition of porcelain or monel metal.

It is well to remember that dioxan, while freely miscible with water in all proportions, does not have a violent affinity for the water molecule as does absolute ethyl alcohol. We say that we "dehydrate" tissues with dioxan: the process is a relatively gentle one of replacement, and the water is "soaked out" rather than forcible extracted. Hence the advantage of dioxan over more violent agents. Due to the good penetrating power of dioxan, this steeping process is fairly rapid.

If the procedures of dehydration and infiltration are carefully followed as outlined above, the following methods of tissue technic may be found useful.

Routine Paraffin Sections.

Cut blocks of fresh tissue not more than 2 mm. thick. After cutting these blocks, the remainder of the gross specimen may be placed in an aqueous 10% formalin solution. The 2 mm. blocks of tissue are then treated as follows:

1. Fix 2 hours in the following fixative:
   Formalin — 1 part
   95% ethyl alcohol — 9 parts
2. Dioxan, 3 changes, 1 hour each.
3. Paraffin (56 degrees C.) — 1 hour.

Embed, cut sections, mount on slide with Mayer's glycerin-albumin mixture. Fix to slide with heat and dry out thoroughly before staining.

The formalin-alcohol fixative may be used three or four times. It keeps indefinitely in a tightly stoppered bottle.

Rapid Paraffin Sections.

Cut blocks of fresh tissue not more than 1 mm. thick. Warning: tissue blocks must not be too thick.

1. Fix 15 minutes in—
   Carnoy's solution:
   Absolute ethyl alcohol—6 parts
   Chloroform—3 parts
   Glacial acetic acid—1 part
2. Dioxan, 2 changes—30 minutes each.
3. Paraffin (56 degrees C.)—30 minutes.

Embed, cut sections, mount on slide with Mayer's glycerin-albumin mixture. Fix to slide with heat and dry out thoroughly by repeated heating before staining. Use freshly prepared fixative in dry jar and fresh unused dioxan in this rapid method. Carnoy's solution must be mixed just before use and cannot be kept, as it soon spoils. Use about 20 cc. of this fixative for each small block of tissue. Tissues previously fixed in another fixative cannot be used.

In employing either the routine or rapid method, tissues may be delayed overnight or longer in dioxan, step 2. When tissues are received late in the working day, they can be fixed and held in dioxan overnight, and infiltrated and embedded the next morning. A well known virtue of dioxan: tissues may be left in it almost indefinitely without harmful effects as shrinking, swelling, or hardening.

The two fixatives recommended, Carnoy's and alcohol-formalin, have been chosen after many trials of other fixatives, including those recently devised containing dioxan. Other fixatives may be substituted for special purposes, but in most cases the procedure will have to be changed, if the fixative is changed.

The routine paraffin method above requires about six hours and the rapid paraffin method less than two hours. Using the rapid method, good photomicrographs or enlargements thereof can be released by the technician about three hours after receipt of the tissue. These methods are designed for use in the hospital laboratory and cannot be applied very successfully to the delicate tissue structures encountered in embryology, research, etc. The rapid method is especially useful in handling biopsy tissues; permanent 5 micron sections that stain and photomicrograph beautifully may be completed in about two hours. The superiority of these paraffin sections over frozen sections cut from fresh unfixed tissue is easily demonstrated; frozen sections can be cut and stained in about 15 minutes or less but the results are usually poor in comparison, sometimes so unsatisfactory for critical study that the pathologist will risk only a presumptive diagnosis.

The following rapid staining method is useful:

1. Chloroform—1 minute.
2. Dioxan, 2 changes ½ minute each.
3. Water—½ minute.
4. Hematoxylin, Harris' or other—time varies.

   About 1 minute with fairly intense stain.

5. Wash in water.
6. 0.25% eosin in 25% alcohol—1 minute.
7. Dioxan 4 parts—alcohol 1 part—¼ minute.
8. Dioxan, 2 changes—1 minute each.
9. Mount in euparal or sandrac-camsal-dioxan mixture.

The mounting mediums given are superior to balsam-xylol. Euparal may be purchased. The sandrac medium is prepared by dissolving sandrac in dioxan by warming it carefully on an electric hot plate (caution: inflammable!), filtering, and evaporating to the desired consistency. Mix 9 parts of this sandrac-dioxan solution with 1 part of camsal. Camsal is prepared by mixing salol and camphor in such proportions that a little camphor remains undissolved in the resulting fluid (1).

If it is desired to mount sections in xylol-balsam, transfer slides from dioxan (step 8) to xylol and mount from xylol.

Summary and Conclusions.

Dioxan (boiling point 101 degrees C.) does not evaporate quickly from a paraffin bath at 56 degrees C. This fact may prevent proper paraffin infiltration of tissues in pathological technic if disregarded. A means of avoiding this pitfall has been discussed and two tissue technics presented and recommended.

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THE PROBLEM OF THE BLOOD CULTURE*

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The blood culture problem is one that gives each clinical pathologist and his bacteriologist either great satisfaction when he can confirm the clinician's diagnosis of a blood stream infection or equal dissatisfaction when he fails to demonstrate the organism. We are on the spot, so to speak, when the latter occurs. We wonder, and justly so: Is the culture medium at fault? Is there some special nutrient that should be placed in the medium or is it yet to be invented? Do the media lack some calcium or vitamins to make bigger and better bacteria? Should it be more acid or more alkaline?

After we have thought of the various possibilities of the culture medium, we consider the possibilities of the amounts of the blood that we used. One authority suggests large quantities because with these larger quantities we are more apt to catch the elusive bacteria that happened to be swimming our way. Then we think again of another authority who tells us it is not correct because with the larger quantities of blood, we still have larger quantities of the bacteriacidal antibodies that would kill our bacteria in vitro.

After all this pondering we would conclude that: "We made that culture medium and took the proper precautions. We followed out Dr. so and so's methods to the letter, it couldn't possibly be the culture medium. We varied the amounts of blood so that we had a high as well as a low concentration so that isn't the cause of the culture not showing a positive growth."

But the clinician again consults us and explains that the patient has petechial hemorrhages, the temperature is elevated, there are occasional chills and the heart examination suggests an endocarditis. So the only loop hole for explaining the negative result is on the basis of the patient himself. We attempt to explain that the culture was taken in the morning when the temperature was down. It should have been in the afternoon when the patient should have a chill or the temperature is at its height.

We also make it very plain that one negative culture is not conclusive, also that the cultures should be observed more than 72 hours.

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* *Read before the American Society of Medical Technologists, San Francisco, Calif., June, 1938.*

Perhaps we have overdrawn this picture a bit but we dare say that we have stopped to wonder these "whys" more often with our blood cultures than any other procedure in the clinical laboratory.

In order that we might increase the percentage of positive cultures we have at various times tried all kinds and varieties of culture media. We individualize for a particular patient and use what is thought advisable. But in conducting a training course for technicians we must routine our procedures as far as is possible. We therefore include the following culture media for our blood culture tray. One bottle of Brain Broth; one bottle Dextrose Broth; one tube of Peptone water; one sterile tube for clot culture; one tube of harmone agar and one tube of plain agar. Sterile petri dishes for blood and agar mixture.

Since most of our technicians are called to smaller hospitals and laboratories we must acquaint them with those culture media that we feel will be most adequate and yet readily available for use. We are not using the more complicated media for reasons self-evident.

In recent years we have found it very valuable to follow Gray's[1] technique of blood culture in which he discards the serum of the blood and cultures the clot. As I will show later this has been of great value and has saved the day for us when all other media and methods had failed.

The problem is still further complicated when a common organism, as a Staphylococcus is grown in one or two tubes. We disregard such a culture and demand a second. However, if all culture media and plates contain the growth it is regarded as diagnostic.

Still one more headache in this problem is an organism that is found several days after the culture has been set aside as sterile. Is it a contaminant or should one consider it diagnostic? At first we felt that our technique in transferring the cultures was faulty and therefore should not be considered diagnostic. Yet in this group we find a pleomorphic streptococcus that we first see as a Gram-positive diphtheroid bacillus that upon repeated transfer begins to form chains of gram positive cocci. We disregarded these at first as diagnostic but from cases we will quote we are convinced that these organisms represent dissociating streptococci and are capable of producing an endocarditis. These are but rarely found in ordinary media but can more often be demonstrated by culturing the clot.

One case history illustrating one of these problems is that of W. H., St. Lukes, 72125, age 21, a patient of Dr. Fred Whitaker,

who developed joint pains after a sore throat. During his two months' stay in the hospital his temperature was always between 100-105° F. The patient was very septic at all times. As evidence of a general sepsis were multiple abscesses that had to be opened. These contained a thick foul smelling gray-green pus in which no organisms could be demonstrated by smear or culture. Three whole blood cultures were repeatedly negative after 7 days observation. However, a blood clot culture taken about ten days before death showed a pleomorphic Streptococcus after six days of incubation. The patient ultimately developed definite signs of an endocarditis and subsequent pains in his side were interpreted to be showers of spleenic infarcts. Pain in his leg was not interpreted until after the autopsy when a ball valve thrombus in the iliac artery was found. Extensive vegetations on his mitral and aortic valves were the source of his spleenic and kidney infarcts. In these vegetations diphtheroid bacilli as well as short chains of Streptococci were seen. No organisms either before or after death could be demonstrated either by smear or culture from the metastatic abscesses. The clot culture in this case was the only method by which the organism could be demonstrated.

In another patient, J. F., St. Luke's 74855, age 49, a patient of Dr. J. T. Bird were definite signs of an endocarditis and septic type of temperature varying from normal to 103-104° each day. Repeated cultures of the blood in Dextrose and Brain broth, plain and harmone agar, gave negative results. The culture of the clot showed a Gram-positive diphtheroid bacillus at the end of two and a half weeks' incubation. This organism after three sub-cultures showed occasional cocci in short chains although many diphtheroid bacilli were still evident. Upon repeated subculturing the number of bacilli decreased and the number of chained cocci increased. We were never able to obtain a subculture with a pure growth of cocci.

About one month after the original positive clot culture a pure growth of a Streptococcus Viridans was isolated from a second clot culture after ten days' incubation. This patient came to autopsy and in the smears of the vegetations of the mitral valve both cocci and diphtheroid bacilli could be demonstrated.

A more recent case should be included in this discussion because it gave us an unusual opportunity to study the patient. The patient was a male, age 45, who was under the care of Dr. J. B. Plastino. He had been acutely ill for several weeks during September, 1937, with a naso-pharyngeal infection that seemed to leave him weak and debilitated. There was a repeated slight afternoon temperature

but no heart murmurs. Urine, blood counts, Widal, x-rays of chest were all essentially normal. The first blood culture was taken January 13, 1938. Five cc. quantities of whole blood were inoculated in Gray's media[1] and two clots from 5 cc. of blood were also inocculated in Gray's media. The latter remained sterile but from the whole blood a gram positive coccus in short chains was isolated.

A week later, January 22nd, a second blood culture was made. After one week incubation a diphtheroid bacillus was isolated from the clot culture. These organisms after the third transfer were morphologically becoming cocci. From a third blood culture on February 7th, a diphtheroid bacillus was isolated on the fourth day.

Three more blood cultures taken at about weekly intervals all showed the same diphtheroid bacillus which upon subculture became a Gram-positive diplococcus whose colony was descrete, small and appeared as a non-hemolytic streptococcus.

About two months before death, he suddenly developed definite signs of meningitis. The fluid was cloudy and the cell count was 69 per cu. mm. The smears showed encapsulated, short, gram negative, non-motile bacilli occurring in pairs and short chains. Culturally it appeared as a Friedlander Bacillus. After an intensive course of sulphanilimide his neurologic symptoms subsided and all spinal fluid findings returned to normal. In view of the persistent blood culture findings it is difficult to account for this second organism which so promptly cleared following sulphanilimide.

The patient died after an illness of about six months. Autopsy showed an extensive ulcerating endocarditis of the mitral and aortic valves, numerous infarcts in spleen and kidneys, necrotic areas in the heart muscle, a recent broncho-pneumonia, a hydrothorax and pericardium and a cerebral softening due to an old infarction. Microscopically many of the smaller vessels in many organs showed evidence of infected and organizing thrombi. Bacteriologically the lung contained both the diphtheroid and coccus phrase. In the heart's blood, pericardial and pleural fluid and brain a chained Gram-positive coccus was isolated. Smears and cultures from the vegetations showed both gram positive cocci and pleomorphic diphtheroid bacilli. Therefore confirming our previous observations of the presence of the diphtheroid bacillus which upon repeated subcultures would become a coccus. It should be observed also that at the source of the infection, the heart valves, one finds evidence of the pleomorphism while in the metastatic lesions the matured organism (if that is the correct interpretation) is found.

Discussion

We have been taught that the diphtheroid bacillus obtained from human sources is non-pathogenic. However Kessel and Romanoff[2] reported a non-fatal case of generalized infection including meningitis in which four blood cultures and the spinal fluid revealed the diphtheroid bacillus. In 1934 Foord and Stone[3] reported a case of endocarditis from which the patient succumbed and in the heart valves these pleomorphic Streptococci were found. In a discussion of roughness of Streptococcus cultures Tunnicliff and Woolsey[4] state that eighty-four per cent of the cultures showed signs of roughness either morphologically or colonially or both. Their observations suggest that the rough element of Streptococcus cultures may be an essential factor in the production of endocarditis.

In a review of a series of cases of Infectious Arthritis, Moffit and MacCulloch[5] found about 20% of the blood cultures positive. Of these seventy-one per cent were of the pleomorphic types. I might add that in this series the patients were in various stages of arthritis. No attempt has been made to correlate the heart findings with the positive cultures. From a clinical response to their vaccine some cases were reported to improve after the addition of these organisms to their vaccine whereas before no progress was reported. We feel therefore that the finding of these organisms is significant.[6]

Summary and Conclusions

We have attempted to call your attention to a routine blood culture technique that in our experience has given us uniform satisfaction as the individual case allows. We wish again to stress the advisability of including in the routine blood culture not only the usual pour plates of plain and harmone agar, as well as the usual Dextrose and Brain broths. It is also advisable to culture the blood clot in a suitable medium. Here we suggest the one that Gray describes.

We also want to impress upon you the advisability of following the cultures over periods of weeks rather than days, since the culture may develop a growth at the end of several weeks. Contrary to our previous teaching a diphtheroid bacillus may be pathogenic if grown from a blood or clot culture. This organism may morphologically appear as a streptococcus upon repeated subculture upon artificial media. Such organisms have been demonstrated in the vegetations of a sub-acute endocarditis, in the three cases reported here and others reported in the literature.

This pleomorphic Streptococcus should be considered pathogenic particularly if repeatedly cultured from the blood of a patient with an undoubted septicemia.

Finally we wish to emphasize the value of culturing the blood clot. As indicated above the causative organism would not have been discovered except by this procedure.

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THE FUTURE OF MEDICAL TECHNOLOGY*

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Medical Technologists fall naturally into three classes, two of which threaten the future of our profession.

The first group is made up of purely indifferent offenders. They accept the privileges the American Society of Clinical Pathologists has given us through years of planning and untiring effort, and the growing respect which we consequently enjoy, and sit placidly waiting for someone else to give them new opportunities for development.

The other group, feeling secure in the place the Pathologists have given us, wish to step out and conduct their own laboratories. Let us hope this group is small, for such a step would only open our ranks to the graft and political exploitation which we know can exist even in our democracy. The realization of our aims and ambitions depends upon our remaining in proper relationship to our leaders and directors, the Clinical Pathologists. We are trained for technical service, not to correlate the results of our tests with clinical symptoms. If we were, we would be physicians or pathologists. But we have a vital role of our own to play in the drama of medicine; a role which grows in importance each year and whose value we can enhance. Some of the greatest contributions to the world's knowledge of disease came from men who labored in poorly lighted, ill-equipped laboratories . . . perhaps in this room there is another Pasteur . . . a Madame Curie. . . . No other work in the world holds so many thrills for those engaged in it. For each day, it holds a new challenge—a challenge to work more diligently, more painstakingly, more scientifically. We should not desire the independence of a laboring trade—it would be a very poor substitute for a noble profession which can serve humanity if we will spend our efforts to increase our ability and efficiency.

We have been carefully nurtured by our pathologists. From dishwashers and handy-men we have developed into individuals with background, purpose, and a professional future. The pioneer work is finished; the pathologists have arranged special curricula in colleges and universities for our basic training and established practical training schools to fit us for actual practice, but there is

* *Special mention—non-scientific paper read before the American Society of Medical Technologists, St. Louis, Mo., May 20, 1939.*

still much that we can do. A great program of education lies before us.

We still must educate the masses of physicians in the value of certified laboratory workers. Although the American Medical Association recognizes the plan of training which the American Society of Clinical Pathologists has laid out for us, and although the American College of Surgeons recommends that the hospitals they approve employ registered Medical Technologists, we know that they are merely scattered over the country. The most recent hospital issue of "The Journal of the American Medical Association" lists 5,512 approved hospitals. A check over our roster shows that if every Medical Technogolist in the United States were in a different hospital, less than three-fourths of the hospitals would be served by registered Medical Technologists. However, this is a high estimate, since we know that many technicians are in offices or that several are employed in a single hospital. In Oklahoma, where it was a simple matter to check the professional affiliations of technicians, only eleven of the 103 approved hospitals employ registered medical technologists. We know a similar condition exists over the country. It seems we have failed to show the difference between registered and non-registered technicians. We must create an interest among physicians in the practice of medical technology; for unless a feeling of mutual confidence and trust can be developed, unless we give so much of good workmanship and pleasant association that a gradual confidence and dependence upon our assistance shall arise, we cannot even hope to realize our ultimate goal of a broad and firmly founded science of laboratory medicine in which we shall have a vital part.

Much can be done by merely acquainting physicians with the ideals and efforts of the medical technologist. Our own state society has made it a practice to place an exhibit at every meeting of the state medical and clinical societies as well as at a number of hospital association meetings. The first one or two made little impression; but gradually our placards and demonstrations attracted attention, until now we can boast that we are even asked where medical technologists can be secured, and what standards laboratory workers must meet before they are eligible for examination.

I thought you might be interested in these exhibits and have set them up in miniature so you may examine them later if you wish.

However, the best advertising we have is not placards or catchy phrases—but ourselves.

"Let your light so shine before men, that they may see your good works" . . . should be the watchword of every medical tech-

nologist. We must be so fundamentally and basically trained that we can keep abreast of the ever increasing diagnostic procedures and can with the advise of the pathologist adapt the improved procedures to those of the laboratory in which we work. By sheer superiority, we must overcome the physician's distrust in laboratory medicine which has grown out of the haphazard reports of untrained laboratory technicians, the mere parrots of laboratory tests, the cookbook chemists, the sink-test experts.

I feel sure that if physicians are able to see the difference between trained and untrained laboratory workers they will demand the best. It is up to us to make it possible for them to see the difference.

Humanity can benefit from progress in laboratory medicine only if all the technicians are basically trained, alert, conscientious, and dependable. We must create in the multitude of unregistered technicians, a desire to attain the qualifications which will enable them to be certified. This can best be accomplished through individual contacts. The scientific discussions of our state society and local roundtables have always been open to anyone interested in laboratory work. Five technicians have registered through the efforts of our own local rountable in the past two years. That may seem like a very few, but when you consider that there are only seventy medical technologists in Oklahoma, it is a percentage to be proud of.

Moreover, we must arouse medical technologists to a realization of their responsibility to their profession. We must make ourselves responsible for their education in the merits of a strong national organization through which we can work out our mutual laboratory problems and develop a high standard of efficiency and ethics.

There are a number of questions which we can ask ourselves as medical technologists, that might provoke some constructive action:

(1) Are we enjoying fully the privelege of being medical technologists?

(2) Are we availing ourselves of the opportunities which are offered the American Society of Medical Technologists by the American Society of Clinical Pathologists and the medical profession in general?

(3) Are we joining other medical technologists who are working individually and collectively as the American Society of Medical Technologists toward a fuller realization of our aims and purposes?

If not, just consider for a moment the unlimited opportunities for service and personal development we are ignoring:

The fact that we are medical technologists indicates we have more than average interest in our fellowmen, for we did not choose our field of work because it seemed the easiest thing to do or because it offered fame and a great fortune. We chose to be medical technologists because of an irresistible force that seemed to hold us when we first saw a malarial parasite or a tiny germ that had produced death and even plagues or saw for ourselves the reactions in our test tubes that would eventually influence the chance for life or death of a fellowman. Perhaps you do not feel particularly fired with the glory of your work every day, but only such a spirit will hold a technician to his work day after day and make him a credit to his profession. How much better if we could feel that thrill every day—the elation of having a small part in working out the problems of life and its processes.

But it is so easy to fall in a rut unless we keep up to date and inspired through contacts with the outstanding leaders in medical science. Through the efforts of the American Society of Clinical Pathologists, the men who have developed the tests and written the books we use daily are made available to us at the annual conventions of the American Society of Medical Technologists. We have the privilege of their counsel and advice and their inspiration. The privilege of visiting the American Medical Association exhibits; and a journal from which we may glean pointers on technique and new procedures and to which we may contribute are other opportunities offered by the American Society of Medical Technologists.

Registration is a privilege bestowed upon us by the American Society of Clinical Pathologists and membership in the American Society of Medical Technologists is a responsibility and an opportunity to show our appreciation for our profession through cooperative effort with other medical technologists toward the realization of the high goal we have set for ourselves.

This convention is a turning point in the history of our society. We came knowing that we were about to make changes in our constitution and plan of organization which would have far reaching effects upon our profession. In looking to the future, we should again consider our avowed objectives and reshape our plans to their eventual fulfillment.

Before we can take any important step toward the realization of these objectives, we must consider our natural resources, chief of which lies in our membership. Perhaps if we can properly evaluate the significance of the fact that as the number of registered medical technologists grows, the per cent who support the American Society

of Medical Technologists steadily decreases, we will have solved one of the greatest problems before our organization. It is really deplorable that so few registered technologists are enjoying the proviliges and responsibilities of the American Society of Medical Technologists; that so few are enjoying the inspiration and stimulus which this meeting has brought us.

If we will only avail ourselves of the wealth of ability that abounds in some 5,000 medical technologists, the realization of our aspirations will be a comparatively simple matter. How can this ability be attracted? This problem is before every member of the American Society of Medical Technologists. It is impossible for one person or the Journal to solicit 3,000 new members, but if the Registry, the American Society of Medical Technologists' Journal, the American Society of Clinical Pathologists' Counselors, and every individual member of the American Society of Medical Technologists will support an expansive program, we can move forward rapidly.

There are improvements needed in the Journal, in the conventions, and in our attitude toward our aims, ideals and associations. These should come from a larger representation of medical technologists than that which now makes up the society. They cannot be made unless a new spirit and renewed devotion to our ideals overwhelms the individuals forming the society.

We must give other medical technologists an opportunity for self-expression. We must give them an active part in our program. One of our objects is to charter subordinate societies—state societies. The most important work falls to individuals and local groups. Our national organization should represent all medical technologists through a body selected by the respective state societies. But the local groups should be free to meet their problems as the individual occasion demands. Their doors should be open to anyone interested in laboratory work. In almost every case the unqualified worker will be inspired to study and become worthy of the work he does, or seeing his inferiority will drop out. Either is a contribution to laboratory medicine.

We have a local roundtable of medical technologists, a group of ten, which meets monthly. Papers, centered about a central plan of study, are prepared by the individual members and are discussed informally. The regular procedure is varied occasionally by special papers by pathologists or physicians. The good will and the interest in each other's and our mutual problems which has been created through this association is priceless.

Local study groups, state meetings with inspiring speakers, our national convention are all means of keeping up to date, alert, and progressive. The American Society of Clinical Pathologists is striving constantly to give us every opportunity for development. The American Society of Clinical Pathologists' Supplement, The American Society of Medical Technologists' Journal (which the pathologists have always encouraged and often subsidized), the privilege of attending exhibits at various medical meetings are some of the measures they have taken to keep us abreast of "Best" Technology. The men who have taken the lead in the development of laboratory medicine are a constant source of inspiration to us as special speakers and lecturers. Now the American Society of Clinical Pathologists is offering us a new and very valuable aid—post-graduate courses in the various fields of practice of medical technology. They have been inaugurated so recently that we cannot yet appreciate their true value, but they will mean much to us in the future. Think what a privilege it will be to work for a few weeks under the direction of the man who has contributed most to a special field of work. Surely such inspiration will lead us to great accomplishments.

We owe it to our fellow medical technologists to see that they are inspired with a desire to contribute personally and actively to the progress and elevation of their profession. Through the American Society of Medical Technologists and its accomplishments, we should be able to indicate the worth of registration and the idealistic scope of our endeavor. Let us again resolve to make ourselves worthy of the responsibility which the physician's and patient's trust in our work place upon us; let us rededicate ourselves to a new loyalty to our ideals.

Our Future is in our own hands.

EDITORIAL

A SHORTER CATECHISM

What is a technician?

A technician is a person, usually a woman, who spends two years or more in college so she can demand a salary which a stenographer gets after finishing high school.

How did technicians originate?

Once upon a time long ago I can remember when we had oil lamps, no phones, no automobiles, no radios and no technicians. Those were the horse and buggy days. Pathologists were newcomers on the medical horizon and laboratories were few. The Pathologist did his own work. In those days there were no Wassermans, no precipitation tests, no blood chemistries, no basal metabolisms, no undulant fever, no tularemia, no typhus and no technicians. The Wasserman test made the clinical Pathologist and his laboratory necessary. When the work got heavy the Pathologist looked around for help and logically took into his employ a person who would do the more routine and technical details without complaint and for less money than he got for the same service. From the days when laboratory examinations were occasionally done for specific indications to the present routine requirement for almost every patient, is measured by the change from personal service of the Pathologist to a few to an impersonal mass production service to all. Out of this evolution came the necessity for trained workers. Not so highly trained as to be wasting talents on simple work nor so expensive as to make the work prohibitive to the person in moderate circumstances. And so the Pathologist became a supervisor and the technician found a permanent place.

Did they have to go to school in those days?

There were not any schools for technicians in those days. Some of you here, I am sure, got your training entirely in the nature of

EDITOR'S NOTE: *Owing to the nature of this paper, we are utilizing it as an editorial. Same was presented by Dr. Harvey Black at the annual banquet of the American Society of Medical Technologists in St. Louis, May 19, 1939.*

an apprenticeship to some Pathologist. You "learned to do by doing." If you were so fortunate as to associate yourself with a conscientious teacher your training could not be excelled. The more formal training of the present time is necessary to insure uniformly good training, but it cannot offer more satisfactory teaching than that you got from the inspiring teacher. There are too many students everywhere these days for the close personal association of teacher and pupil of former years and this, I think, is a distinct loss.

What do they do?

Some do everything. Bacteriology, serology, hematology, chemistry, all are the same to her and surprisingly enough some do all of these very well. Of course one who does all these, operates the x-ray equipment, acts as nurse and bookkeeper and even suggests medication for the patient when the doctor is busy really has too much to do and probably doesn't do it quite perfectly. These are the general practitioners of the profession and are entitled to a generous appraisal for they have a heavy load to carry. The specialist who confines her activities to one narrow field may and should do much better work, but the general practitioner probably is as necessary here as in the practice of medicine. They are not to be derided when they are making the best of a difficult situation.

Some technicians work in laboratories directly under the supervision of competent Pathologists, some under the direction of medical men who are doing other work but know a great deal of pathology, while others work under no supervision at all. This latter is frowned upon as reprehensible, but as long as some technicians think they know as much as Pathologists and as long as physicians think they can, with safety, avoid the expense of expert supervision, so long will there be a certain amount of unsupervised technical work. Some of it will be rather good and some rather bad but some of it will be done, because of the egotism of some technicians and the stupidity of some doctors.

Of course the question may be raised. Do not technicians know as much as doctors? At least about laboratory procedure and their value? And the answer is, quoting Andy of radio fame, "yes and no, mostly no." Some of them have gone to school longer and more recently than the doctor and can tell him things regarding technique which the doctor never knew. But when the technician tells the doctor because she found a high leucocyte count the patient has appendicitis or that sugar in the urine means the patient has diabetes (and I have heard technicians make just such statements), she is riding for a fall. Medicine cannot successfully be practiced that way. It must be a great temptation to enlighten the doctor

when he is without doubt incapable of doing his own thinking. But if no thinking is tragic we must remember that "a little knowledge is a dangerous thing," and laboratory procedures are frequently only part of the diagnostic picture. Anyway, we older men who were poorly educated are rapidly passing and the education of the physician will not have to be left to the technician long.

Why are most of them women?

One sometimes wonders why women have usurped the field. Of course, they have usurped many fields. As a matter of fact I sometimes wonder if we did not make a mistake in educating women. As long as they were uneducated they were content to do the menial tasks about the home, but we men send them to college and they come home and take our jobs away from us. It is too late now, to be sure, to do anything about it except to wonder sometimes how it all happened. In any event, the male technician is now so scarce that he may be described as a biologic sport and when these few pass from the picture there probably will be no more. Few men like the exacting detail and routine performance required and certainly few could live and marry perhaps on the salary usually paid.

And why are these salaries so low?

Certainly a college graduate with special training in the field ought to be able to command a decent living from the work. But as an illustration, only last year an article in the *Journal of The American Medical Association* stated that competent technicians for serologic work could be employed in New York City for one thousand dollars per year. At least two years in college and one or more years of technical training should be compensated at the rate of eighty-three and one-third dollars per month. One means for low salaries here, as in the profession of teaching, is that many women take on this work to breach the gap between leaving school and entering matrimony and are willing to work for little because employment is not considered permanent. Many live at home and do not have families to support and can subsist on less than the male who has a desire to marry and rear a family. When women compete for jobs with men and offer equal ability they have the advantage often of being able to live on less and when they compete with each other, the same factor plays a part and still further reduces the salary. Unfortunately not so many men, doctors included, pay more than they have to for service. The doctor may have a net income of forty thousand dollars a year but if hard times reduce him to the necessity of getting along on thirty thousand, he begins at once to retrench by reducing the technician's salary from one hundred dollars to seventy-five dollars or less a month. People are like that.

How do Pathologists look upon technicians?

There are probably as many viewpoints and appraisals as there are Pathologists. Some of them, particularly those in salaried positions in schools, hospitals and large clinics, look upon the technician as a satisfactory solution of the labor problem in the laboratory. Some of them, particularly those who see more and more responsibility put upon the technician, wonder if the development is in the right direction. While there are a few who are sure the Pathologist has created a Frankenstein, which will, in time, turn and rend him. This latter group is made up of men who have seen technicians go into active competition with them and have seen their means of livelihood threatened. Even to those of us who have been in the field since its early days and have watched its evolution, it is an interesting situation. From the day when a clinical pathologist drew work from doctors generally in his city we have seen the entrance of the technician into the doctor's office and do so much of the work that the Pathologist finds it impossible to sustain himself except through hospital or other connections. This unquestionably has occured in many placed, but does not, I think, justify recrimination against anyone. It is simply a step in the evolution of medicine which comes inevitably but unpleasantly to some of those involved. Years ago I was the only one in our city equipped to do basal metabolic determinations and I had many to do. In the course of time the instruments were simplified and cheapened and many men found it desirable and feasible to make their own tests. I may have regretted the lost work but I could not protest against the logic of the change. The technician has, of course, come to stay. We could no more do without her than we could go back to the horse and buggy. But always during these evolutions there are adjustments to be made. Sometimes individuals are hurt in the process of the change and protest vehemently because of it. Technicians will do well to remember that problems of the Pathologist and the technician are mutual, that some of them are economic and that a time of change is always provocative of some injury and some bad temper. As a matter of fact, neither can live without the other and a generous attitude on the part of both is greatly to be desired.

Finally, what become of technicians when they die?

It would be nice to say that they all go to Heaven, but of some of them I have my doubts. There are those who are "a thing of beauty and a joy forever." They cause the heart of the Pathologist to swell with pride when he talks about them. They make his tasks easy and his burden light. If he prays at all (and occasionally you hear of one who does) he prays that she may be carried to her just

reward—but not until he gets too old to run a laboratory. She is the apple of his eye, the one among ten thousand.

But, sad to relate, there are others. If they go to Heaven, no one there will know what to do with them. There are those, you know, who are more expert with their lipstick than with a pipette and who are more concerned about whether their powder is on straight than whether the mathematical calculation is straight. They are the ones who protest against heavy days but spend the evenings with heavy dates. They are not concerned whether they can register as technologists if they can only register with the boy friends. They are an abomination in the sight of the Lord and an ever present cause of trouble. Surely, they shouldn't want to go to Heaven. But as a matter of sheer practicality, there probably will be no Pathologists there, so they may as well go there as elsewhere. The Pathologists will not be in a position to argue about it, which after all is just as well. As for me, I hope they all may go to Heaven—but not too soon.

HARVEY BLACK, M. D., Dallas, Texas.

ABSTRACTS

RECENT LABORATORY TESTS FOR THE EARLY DIAGNOSIS OF PREGNANCY; A CRITICAL REVIEW: A. E. Weisman, Am. J. Obst. & Gyn.; 35:354; 1938. A classification of 25 pregnancy tests with methods, merits, demerits and reliability of each; exhaustive bibliography.

Studies in the Reproduction of Xenopus Laevis: Lionel Berk; Dept. of Physiology, Univ. of Capetown, So. African J. of Med. Sc., Vol. 3, No. 2, Apr., 1938, p. 72. Evidence that the anterior pituitary controls the sexual cycle of Xenopus Laevis; climatic conditions influence pituitary activity; curves are drawn to depict these relationships.

PRESERVATION OF COMPLEMENT FOR THE WASSERMANN REACTION: C. A. Green, J. Path. and Bact., vol. 46, No. 2, March, 1938, p. 382.

The author reports observations on complement concentration of guinea pig sera preserved according to Sormenchein's method, by adding an equal volume of sterile distilled water containing 12 g. sodium acetate and 4 g. boric acid per 100 cc. There was no apparent loss in haemolytic power after 7 months.

IDENTIFICATION OF LIVING UNSTAINED LEUCOCYTES BY DARK-GROUND ILLUMINATION: L. Whitby and M. Hynes. J. Path. and Bact., vol. 46, No. 3, May, 1938, p. 517.

A technique is given for darkfield examination of living leucocytes. The authors state that young forms frequently show greater maturity by this method than by the staining methods and thus that true myeloblasts in peripheral blood are rarely seen.

Motility of young monocytic cells differs sufficiently from that of the myeloid series to aid differentiation and possibly help to place them in the cell development scheme.

ISOLATION OF THE MINERAL DUST IN LUNGS AND SPUTUM: N. Sundius and A. Bydgen. J. of Ind. Hyg. and Tox., vol. 20, No. 5, May, 1938, p. 351.

Various methods for dissolving lung material are discussed but most of them also change the dust particles too much for identification. A method using Perhydrol (Merck) with 30% hydrogen peroxide is recommended. Where carbonates are in question or asbestosis bodies are to be isolated without chemical alteration, mechanical methods may be used.

THE DETERMINATION OF GLUCOSE TOLERANCE: C. Wallace Ross and Eva L. Tonks. Arch. Dis. Childhood. Vol. 13, No. 76, Dec., '38, p. 289.

Factors influencing both oral and intravenous tests are given. The authors suggest that by using a combination of both, deficiency in absorption of digested carbohydrate may be demonstrated.

NUTRITIONAL ANAEMIA IN AN INDUSTRIAL DISTRICT: J. H. Hutchison. Arch. Dis. in Childhood. Vol. 13, No. 76, Dec., '38, p. 355.

A survey of hemoglobin values in small children revealed that 26% of the breast-fed and 35% of the bottle-fed were at least 10% below the Mackay Hemoglobin values due primarily to prolonged milk diet, low birth weight and infections.

THE AMOUNT OF SPLENIC LYMPHATIC TISSUE AT DIFFERENT AGES: J. Hwang, S. Lippincott and E. Krumbhaar. Am. Jr. Path. Vol. XIV, No. 6, Nov., '38, p. 809.

The lymphatic tissue of the malpighian follicles was found to decrease as does that in other parts of the body except that this decrease is sharper in the second decade of life and the amount is then maintained with a slight increase in the 6th and 7th decades.

ERYTHROPHAGOCYTOSIS IN ANEMIA OF THE NEWBORN: T. Wyatt, M. Cooper, W. Groat. Am. Jr. Dis. Child. Vol. 56, No. 6, Dec., '38, p. 1317.

Report of three cases of anemia of the newborn with blood smears showing phagocytosis of erythrocytes by a monocytic type of cell.

THE EFFECT OF ASCORBIC ACID DEFICIENCY ON ENAMEL FORMATION IN THE TEETH OF GUINEA PIGS: Paul Boule. Am. Jr. Path. Vol. XIV, No. 6, Nov., '38, p. 843.

Ascorbic acid deficiency does not interfere with formation of enamel but may result in formation of hypoplastic areas due to failure of formation of bone matrix and collagen fibres. Dentin formation is also retarded.

THE CAROTINOIDS AND VITAMIN A OF THE BLOOD: S. W. Clausen and A. B. McCoord. Jr. of Pediatrics. Vol. 13, No. 5, Nov., '38, p. 635.

Methods are given for total carotinoids, carotene and xanthophyll and vitamin A. Results of a series of determinations made in the different age groups in various illnesses are given. Infection

and fever cause a considerable decrease in carotene, xanthophyll and vitamin A in the plasma. This may rise above the normal on the return to normal temperature.

EXPERIMENTAL THERAPY OF ACUTE LEUKEMIA WITH EXTRACTS OF BONE MARROW: J. V. Cooke. Jr. of Ped. Vol. 13, No. 5, Nov., '38, p. 651.

The author suggests that acute leukemia may result from a deficiency of factors needed for maturation in the bone marrow of granular leucocytes. Case reports of children with leukemia, treated by injection of bone marrow extract are given. Some underwent periods of remission while others merely showed an increase in maturity of granular leucocytes.

RED CELL FRAGILITY IN VARIOUS BLOOD CONDITIONS: D. A. K. Cassells. Jr. Path. and Bact. Vol. XLVII, No. 3, Nov., '38, p. 603.

Results of fragility tests on a group of anemias of several types, jaundice and splenectomy. The author also discusses factors, other than anemia which may influence the fragility.

THE PREPARATION OF GOLD SOLS FOR THE LANGE TEST: S. W. Pennycuick, C. E. Woolcock and R. J. Cowan, J. Path. and Bact., vol. 46, No. 3, May, 1938, p. 549.

Presentation of a method in which by adding the necessary number of gold particles before reduction, the necessity for elaborate precautions of preparation are eliminated.

BOOK REVIEWS

MEDICAL OCCUPATIONS AVAILABLE TO BOYS WHEN THEY GROW UP, by Lee M. Klinefelter, B.S., M.A. Illustrated with Photographs. First Edition, 1938. Publishers, E. P. Dutton & Company, 300 Fourth Ave., New York, N. Y. Cloth, $2.00.

Joe Wright, a boy in his teens, has just had his appendix removed and while convalescing is fired with the ambition to become a doctor. Beginning with his own physician Joe carries out a series of investigations of all the medical occupations before he decides which one he shall follow. He interviews many people employed in various medical activities, asks many pertinent questions and receives detailed answers. Finally he makes a table of twelve different medical occupations, namely, medicine, dentistry, veterinary, pharmacy, optometry, chiropody, physical and occupational therapy, medical technology, xray technician, nursing and dental technician. In the table he shows for each the number of years preparation required beyond high school, the average annual cost of education, the approximate number of men in each occupation, the average income and the future prospects. At the end of each chapter there is a bibliography of the subject under discussion and a list of the approved or available schools with their requirements. For the boy with ambitions along some line of medical occupation this book will be found to be most helpful. There are 67 full page photographs.

CLINICAL BACTERIOLOGY by F. A. Knott, M.D., M.R.C.P., D.P.H., Director, Bacteriological Department, and Lecturer in Bacteriology, Guy's Hospital. London. With 60 illustrations including 12 plates. Pp. 426. Washable fabric. Published February 17, 1939. P. Blakiston's Son & Co., Inc., 1012 Walnut Street, Philadelphia, Pa. Price $4.50.

This book might well be titled "Applied Bacteriology." It deals with the practical applications of bacteriology. It serves as an excellent connecting link between the purely laboratory aspects and the advanced theoretical or research science of bacteriology. Descriptions of technique, the less important cultural reactions, etc., have been reduced to a minimum while the applied science has been stressed in much more detail, particularly as regards its most recent lines of advance. It tells which diagnostic reactions are the best to use in specific diseases. It describes which organisms are the most common offenders in osteomyelitis. In fact it gives the information that the clinician often seeks for in laboratory manuals of bacteriology but finds with a great deal of difficulty or not at all. Prophylactic measures against diseases are described when

deemed of value. Infectious disease management in home and hospital is given in detail and all from a very practical viewpoint. The simple or, one might even say the conversational style of writing with which the author is gifted enhances the value of this book from the practical as well as the purely informative aspects. The book is recommended for pathologists and clinicians and for the technician who wants to know something of the practical application of his work outside the laboratory.

GOULD'S POCKET PRONOUNCING MEDICAL DICTIONARY
by the late George M. Gould, A.M., M.D., revised by C. V. Brownlow. P. Blakiston's Son & Co., Inc., 1012 Walnut Street, Philadelphia, Pa. Eleventh Edition. Flexible, Washable Fabric, $2.00; with Thumb Index, $2.50. Published Jan. 10, 1939.

Over 40,000 principal words used in medicine and the collateral sciences are pronounced and defined. In addition there is an appendix containing complete tables of the arteries, bones, chemical elements, hormones, micro-organisms, muscles, nerves, prefixes and suffixes, phobia's signs and symbols, etc. A physicians' dose-list with their incompatabilities and a veterinary dose-table are included both in English and metric measures. These are based upon the eleventh revision of the U. S. Pharmacopoeia. Many new words are found in this edition. The inclusion of the prefixes and suffixes greatly enhance the utility of the dictionary as many words can be modified and new meanings evolved. It is claimed by one of the authors that in this little dictionary many sound medical terms are included which cannot be found in any other medical dictionary.

NEWS AND ANNOUNCEMENTS

REGISTRY OF MEDICAL TECHNOLOGISTS
OF THE
AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS

The April, 1939, Registry examinations were conducted in various cities throughout the United States, Hawaii and Puerto Rico, as well as Canada. There were 418 applicants who appeared for the practical and written tests, which were conducted by 134 clinical pathologists and their assistants throughout the morning and afternoon of April 28th.

WRITTEN QUESTIONS FOR EXAMINATION APRIL, 1939
(Maximum Time for Written Examination—3 hours)

IMPORTANT—Select 10 out of 11—DO NOT answer more than 10 questions.

I. 1. Make a sketch of the blood counting chamber and label the dimensions of the square surface of each representative division.

2. Using the ordinary counting chamber, how do you estimate the total number of cells per cu. mm. in spinal fluid?

II. 1. Make a diagramatic sketch of white cells included in Schilling's classification of neutrophils.

2. Without multiplying the first two digits of the total red count by 2, give the formula for calculating the percent of red blood cells in a blood count.

III. Define:

1. Thrombocyte
2. Leukopenia
3. Normoblast
4. Reticulocyte
5. Myeloblast
6. Color Index
7. Basophilic Stippling
8. Clot retraction time
9. Relative Lymphocytosis
10. Piokilocytosis

IV. 1. What is the normal number of polynuclear cells per cu. mm. of blood and the normal number of lymphocytes per cu. mm. of blood? (Do not express in percent.)
2. Express as a simple fraction or ratio the relation of red blood cells to white blood cells per cu. mm. of normal blood.

V. 1. Name three protein constituents of blood plasma.
2. Name three non-protein constituents of blood plasma and give their normal values in grams percent.

VI. 1. Give two methods of preparing the filtrate for routine chemical analysis of blood.
2. Give the technic for the determination of sulphanilamide either in blood or urine and designate all reagents used by their chemical name.

VII. 1. How do you perform a Friedman test for pregnancy?
2. Describe your technic in either a mastic test or colloidal gold test on spinal fluid.

VIII. What culture medium and what method of cultivation would you use in the following:
1. Thoat culture for diphtheria.
2. Blood culture.
3. Culture of urine for the Brucella abortus.
4. Culture of stool for the Eberthella typhi (Typhoid bacillus).
5. Culture of fluid for the gonococcus.

IX. 1. Why is dimethylamino-azobenzol or Topfer's reagent used as an indicator in the titration of free hydrochloric acid in gastric juice and phenolphthalein in total acidity?
2. Name three distinct and different types of test meal.

X. Make a large and distinct drawing of the following:
1. Ovum of Necator americanus (hookworm)
2. Ovum of Trichocephalus trichiurus (whip worm)
3. Ovum of Ascaris lumbricoides (large round worm)
4. Ovum of Enterobius vermicularis (pin worm)
5. Ovum of Hymenolepis nana (dwarf tape worm)
6. Ovum of Taenia saginata (beef tape worm)
7. Larva of Strongyloides stercoralis
8. Cyst of Endamoeba histolytica
9. Cyst of Endamoeba coli
10. Trichomonas vaginalis

XI. Differentiate between the pH. of a solution and the Titratable acidity.

NATIONAL

ST. LOUIS SESSION

PRESIDENT'S MESSAGE

American Society of Medical Technologists,
St. Louis Convention,

Greetings:

I regret that circumstance necessitates my absence from the convention. May I ask that your support be given to those who will act in my stead.

Conventions serve the same purpose, to the members attending them, that a "telephone repeater" does to a long distance telephone conversation.

Normally, as a voice travels over the wire, it grows weaker. At specified distances along the way, it is picked up by these "repeaters", given new volume and tone and sent on again. This process may be repeated several times, depending on the distance, before the voice reaches the listener, clear, full and distinct, from across the country.

So it is with conventions.

Normally, as our fiscal year progresses, the enthusiasm and vigor felt for society welfare, wanes somewhat. We lose a little of the convention inspiration and fire. It is at the next convention then, that we receive new life, new determination, renew our resolutions and enjoy the exchange of knowledge and methods with our fellow workers. In short, we gather momentum and increased "volume", so to speak, to carry us through the year and to the next convention.

The inspiration of the San Francisco convention has worn well through this year, as the accomplishments of our combined efforts will disclose.

Through the courtesy of the Registry, a letter of "advertising" from our society, was sent to every Registered Technologist in the United States, stating the purpose of our existence, the benefits to be derived from membership therein, and an invitation to join our ranks.

At the time of my last and recent report, we have, as a direct result of this letter, 450 requests for application blanks, 106 applications filed at the office, 66 completed memberships and 90 requests for information about subscription to the Journal.

The total number of filed applications is 251, and the total number of new memberships so far, is 154.

The society has received further advertising and publicity through an article which appeared in the "Weekly News Review", a publication distributed through educational institutions. Approximately 250 letters have been received by the office asking for information concerning the field of Medical Technology, as a result of this article. Many of these requests came from Superintendents of Schools and Vocational Guidance Instructors.

In the recently published "Vocational Occupations", the American Society of Medical Technologists is listed as the representative group in the field of Medical Technology in the United States and the Journal is mentioned as the official publication of the organization.

The Constitution Committee is due a great deal of credit for the work done on State Affiliation. They have put in double time, since they published two separate proposed revisions of the Constitution. The first one was sent to the membership in November. The purpose of this early proposed revision was to solicit the ideas, criticisms, corrections, and additional data of the membership at large. By this method, the committee hoped to ascertain and incorporate, in the final proposed revision, the opinion of the majority upon our problem of state affiliation.

After this data from the membership had been received and compiled by the committee, they consulted two competent lawyers, one of whom is the former Secretary of the American Bar Association and experienced in the writing of society constitutions.

The lawyers helped the committee phrase and organize the final proposed revision in the proper manner. Together they have endeavored to make it adequate for all our present, as well as future needs. It is so worded, that if a change becomes necessary, only the By-Laws will need revision.

The Program, Exhibits and Entertainment Committees have done well in their efforts to make the convention educational and enjoyable.

All of the Committees have functioned willingly and have contributed their part toward what I feel will be a successful meeting.

Three new Counsellor Districts have been designated, making a total of nine instead of six.

I wish to take this opportunity to express my sincere gratitude and appreciation to the Registry, the Officers, the Executive Committee, the Advisory Board, the Board of Counsellors, the Committees and the other individuals, who have served when called

upon, for the fine work and the splendid spirit of cooperation exhibited throughout the year.

It has been a pleasure to serve you as president and to make so many new friends. Again may I say, I regret that I am unable to meet each one personally.

May you enjoy, participate in and be gratified by your efforts to attend the convention. And may you leave with a broader vision, renewed enthusiasm, a determination to reach higher goals and with a spirit of progress.

Respectfully yours,

Christine C. Seguin

MINUTES OF THE EXECUTIVE SESSIONS OF THE AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

Held at the New Hotel Jefferson, St. Louis, Missouri, May 18, 19, and 20, 1939

WEDNESDAY, MAY 17, 1939, 4:00 P. M.

An executive committee meeting was held at the new Hotel Jefferson. Those present were Vern Flannery, L. Ray, John Conlin, Marion Baker, Lucille Wallace, John Fitzgerald, Bernice Elliott and Ann Snow. Mrs. Wallace, the national secretary, presided in the absence of Mrs. Seguin, president, and Mrs. Coad, vice-president. Appointment of committees was discussed and instructions from Mrs. Seguin were read by Mrs. Wallace. The adoption of the Constitution and By-Laws was discussed with proposed revisions. Miss Baker moved that the registration fee be made fifty cents. The motion was seconded by John Fitzgerald and passed unanimously. The officers and committee heads were invited to attend the annual dinner given by the Board of Registry.

After the dinner an executive meeting was held at 10:45 P. M. The members of the executive committee as mentioned above were present. Slight changes in regard to state affiliation in Constitution and By-Laws were discussed and planned for adoption. Mrs. Wallace presided.

THURSDAY, MAY 18, 9:00 A. M.

Mrs. Wallace in the absence of Mrs. Seguin called the meeting to order. Miss Ann Snow acting as secretary in the place of

Mrs. Wallace. The invocation was given by Dr. Benjamin L. Schmidtke of the First Methodist Church, St. Louis. The minutes of the last meeting were read by Miss Snow. Mr. Flannery moved that the minutes be accepted as read. Seconded by Mr. Silcock and carried. Mrs. Wallace appointed the following committees:

Resolutions: Miss Clara Becton, Tulsa, Oklahoma, Chairman.
Miss E. Pitch, Lincoln, Nebraska.
Miss Phyllis Stanley, Newark, New Jersey.
Miss Rowena Johnson, Tulsa, Oklahoma.

Tellers: Miss Edna Droeger, Chicago, Illinois.
Miss Florence Petty, Rusk, Texas.
Mr. David Silcock, Versailles, Kentucky.
Mr. John Fitzgerald, Portland, Maine.

Mrs. Wallace announced by request that the University of Kentucky would give a course in Bacteriology and that Dr. F. Shaw of the University of Virginia, Richmond, Virginia, would give a course in Parasitology this summer. Mrs. Seguin's message was then read to the convention body and regret at her absence was expressed. The following committee reports were then given. (All committee reports appended and attached to the original copy of the secretary's report).

Executive Committee—Mr. Vern Flannery, Chairman.
American Journal of Medical Technology and Administrative Secretary—Mr. Conlin.
Membership—Mr. Conlin.
Advisory Board—Marion Baker, Chairman.
Treasurer—Mr. Flannery for Miss Tate.
Board of Counsellors—Mr. John Fitzgerald.
Research Committee—Mr. Dell for Miss Falck.
Local Arrangements—Miss Smith.

Miss Baker gave the report on entertainment planned for the convention and announced the bus trip given by the A. S. Aloe Company, the boat trip up the Mississippi and the dinner at the Castilo. The adoption of all reports as read was moved by Miss Petty, seconded by Mr. Fitzgerald and carried unanimously. Miss Elliott gave a report on the Constitution and By-Laws to be taken up under new business. Miss Elliott moved that a message be sent Mrs. Seguin expressing regret for her absence. Seconded by V. Flannery and motion carried.

Miss Elliott talked on the Constitution and By-Laws in preparation for discussion of same with explanations as suggested by the lawyer. In order to facilitate discussion and voting on the constitution, Miss Elliott moved that Article VI of the Constitution and Article XI of the By-Laws of the American Society of Medical Technologists be repealed. Seconded by Mr. Flannery and motion carried unanimously. Sister Jeannette Bodah read a letter from Miss Marion Gianniny, chairman of the Nominating Committee suggesting that more members be appointed on this committee since three were not present and vacancies on the slate of nominees were to be filled.

Miss Elliott then explained in detail the Constitution and By-Laws as prepared by the lawyer with suggestions from the Executive Committee. Much discussion followd but voting was deferred until Friday at 2:00 p. m., the time set on the program for voting on the constitution to allow all members to be present.

Miss Kroeger moved that the meeting adjourn, seconded by Mr. Hayes of Waco, Texas. Meeting adjourned at 12:00.

FRIDAY, MAY 19, 2:00 P. M.

Meeting called to order by Mrs. Wallace. She then read telegrams to the Society from Mrs. Seguin and Miss Frieda Claussen. Guests were asked to be seated in the rear of room in preparation for voting. Mr. Walter Dell of McAlester, Okla., was appointed Sergeant-at-Arms.

Mr. Flannery explained to the Society the cost of having the Constitution and By-Laws framed and suggested that it be adopted in toto according to the March revision and then take up each section to make such changes as the Society saw fit. He put his suggestion in the form of a motion. It was seconded by Mr. Alton, motion carried with two opposed. Mr. Flannery moved that the total time of discussion on any section of the constitution or By-Laws be limited to 15 minutes since so much discussion had been carried on in the previous business meeting on the same subject. Miss Baker asked to amend Mr. Flannery's motion to read that each person be allowed to talk only once on each question. This was voted upon but lost. The original motion of Mr. Flannery was then voted upon and carried.

Miss Elliott read the proposed revision of Article XI, Section I as recommended by the Executive Committee. Mr. Flannery moved that the following words be struck out of Article XI, Section I, "Persons who hold certificates from and are in Good Standing with the Board of Registry of the American Society

of Clinical Pathologists", and substitute, "Persons who abide by the Code of Ethics of the American Society of Medical Technologists". This motion was seconded by Mr. Silcock. Discussion followed, motion put to vote, for the motion 41, opposed 23. Motion carried.

Miss Elliott moved to change Article II, Section I of the By-Laws by striking out $10.00 and insert $5.00 for the charter fee and striking out $5.00 and inserting $1.00 for annual renewal. Motion seconded by Mr. Flannery. Motion carried unanimously. Miss Elliott moved that the sentence, "All checks shall bear the signature of at least two officers, etc.", in Article V, Section IV of the By-Laws be struck out as being unnecessary and cumbersome. Seconded by Mr. Silcock. Motion carried unanimously. Mr. Fitzgerald asked that voting be done by raising hands instead of rising. This was not put in the form of a motion.

Sister Alquin moved that annual dues of the A. S. M. T. be reduced from $4.00 to $3.00 per annum. Seconded by Mr. Fitzgerald. Discussion followed. Motion lost.

The Constitution and By-Laws were announced to be adopted as revised by the above corrections through the vote of the Society.

Mr. Flannery moved that the meeting place be selected by the Board of Directors. Lost for want of a second. Mr. Flannery then explained the lost motion. Miss Baker then proposed a substitute motion that time and place of meeting be left up to Board of Directors provided that it is not changed from time and place of meeting of the America Medical Association. Seconded by Miss Lyle. Motion carried.

Miss Baker then moved that cards be sent to every registered Medical Technologist requesting their permission to allow the A. S. M. T. to represent them in presenting to the American Society of Clinical Pathologists and their Board of Registry a request to have a registered Medical Technologist as a member of the Board of Registry of Medical Technology. Seconded by Mr. Flannery. Motion carried with only two dissenting votes. Mr. Flannery moved that we have a report of the nominating committee and vote on the slate of officers at that time. Many seconded the motion. Motion lost for voting at that time. Mrs. Wallace called for the report of the nominating committee by Sister Jeannette Bodah, chairman. Sister Jeannette reported that she could not make such a report at that time due to deficiency in number on committee and vacancies in nominees. Mr. Flannery moved that the acting president be empowered to appoint required number to fill vacancies on nominating committee.

Seconded by Miss Johnson. Motion carried. Mrs. Wallace appointed Rose Matthaei of Houston, Texas, Rowena Johnson of Tulsa, Oklahoma, and Ann Snow of Little Rock, Arkansas, to fill the three vacancies on the committee.

Miss Lyle moved that we change the time of meeting and voting from 2:00 p. m. to 1:00 p. m. and notice be placed on the bulletin board to that effect. Objections were raised that many who intended to vote might not be able to if such a change were made. Miss Lyle withdrew her motion

Miss Stockton of Alabama moved that the president appoint a committee during this session to act quickly and write an article for the American Journal of Medical Technology to be published at once to educate absent members in regard to the sending out of the cards concerning representation on Board of Registry. Mrs. Wallace relinquished the chair to discuss this motion and objected to appointing such a committee in that she did not know who would be suitable or who would desire to write such an article. The motion was seconded by Miss Baker and carried. In response to the wishes of the organization Mrs. Wallace appointed the following on this committee: Miss Nell Stockton, Alabama, Miss Fannie Bell Warnock, Urbana, Illinois, and Mrs. Margaret Clark, Little Rock, Arkansas.

Mr. Flannery moved that the slate of officers be placed on a bulletin board in the Scientific session Saturday morning so that members who have to leave early may vote by ballot, seconded by Mrs. Clark. Motion carried.

Meeting adjourned.

SATURDAY, MAY 20, 2:00 P. M.

Meeting called to order by Mrs. Wallace. The slate of officers was read and voting followed immediately with the following results:

The report as given by Teller Fitzgerald was as follows: A total of 77 votes were cast.

President Elect—

Miss Henrietta Lyle, Lancaster, Pennsylvania—65★

Miss Lona Jacobson, Chicago, Illinois—12

Recording Secretary—

Miss Catherine Louise Hanitch, Hopkins, Minnesota—37

Miss Zana Gabriella Skidmore, Tulsa, Oklahoma—40★

Board of Directors—

Mr. Rexford Hansen, Chicago, Illinois—16

Sister Amelia Margaret Klopsteg, Fairbault, Minnesota—16

Mr. David S. G. Silcock, Versaille, Kentucky—49★

Miss Dorothea Zoll, Philadelphia, Pennsylvania—71★

Advisory Board—

Mrs. Christine Seguin, Niles Center, Illinois—33

Mrs. Lucille Brown Wallace, Oklahoma City, Okla—40★

While voting was in progress Mrs. Wallace called for the report of the registration committee which was given by Mr. Flannery in the absence of Miss Burgess, Chairman. The acting president then announced a meeting of all old and new officers immediately after close of present meeting as requested by Mrs. Seguin.

Miss Baker announced the affiliation of the Texas Society as the first state to become affiliated with the National Society.

Meeting adjourned.

Meeting at 3:00 p. m. Saturday of old and new officers.

Meeting called to order with Mrs. Wallace presiding. Mr. Flannery moved that Mr. Conlin contact lawyer for preparing Articles of Incorporation for submission to the Secretary of State of Michigan. Seconded by Miss Baker, motion carried.

Mr. Conlin moved that meeting be the first three days of the A. M. A. in 1940 in order that it immediately follow the A. S. C. P. meeting. Seconded by Miss Elliott. Motion carried.

Mr. Flannery moved that Mr. Conlin print revision of Constitution and By-Laws and Articles of Incorporation to the number of 2000 and send out with the September issue of the Journal. Seconded by Miss Lyle. Motion carried.

Mr. Flannery moved that the incoming president, Miss Elliott, and the president-elect, Miss Lyle, be supplied with a copy of the report of the minutes of this annual session. Seconded by Miss Baker. Motion carried. Miss Baker moved that the Executive Committee be empowered to draw up a form of a card immediately to be sent as per voted upon to every registered technologist concerning representation on the Board of Registry. Seconded by Mr. Silcock. Motion carried.

Mr. Flannery moved adjournment. Seconded by Mr. Fitzgerald. Meeting adjourned.

AWARDS

Gold Medal—Miss Clara Becton, Tulsa, Oklahoma, Paper and Exhibit.

Silver Medal—Marion Baker, Lufkin, Texas, Paper.

Bronze Medal—Dorothea Zoll, Philadelphia, Pennsylvania, Paper and Exhibit.

Special Mention for non-scientific paper—Miss Rowena Johnson, Tulsa, Okla.

Mention—Ida Reilly and Phyllis Stanley.

Committee on Awards

Dr. Larson
Dr. Moore
Leila Woodworth

BERNICE ELLIOTT, M.T.
President, A. S. M. T., 1939-40

The University of Wisconsin Medical School is to conduct an Institute for the Consideration of the Blood and Blood-Forming Organs, September 4-6, 1939. The program is to include papers and round-table discussions by European and American workers in the field of hematology. In addition to the discussions, the following formal papers are to be presented:

Dr. L. J. Witts, Oxford, England, Anemias due to Iron Deficiency.

Dr. Cecil J. Watson, Minneapolis, The Porphyrins and Diseases of the Blood.

Dr. Cornelius P. Rhoads, New York, Aplastic Anemia.

Dr. E. Meulengracht, Copenhagen, Denmark, Some Etio-

logical Factors in Pernicious Anemia and Related Macrocytic Anemias.

Dr. Harry Eagle, Baltimore, The Coagulation of Blood.

Dr. George R. Minot, Boston, Anemias of Nutritional Deficiency.

Dr. Russell L. Haden, Cleveland, The Nature of the Hemolytic Anemias.

Dr. Jacob Furth, New York, Experimental Leukemia.

Dr. Claude E. Forkner, New York, Monocytic Leukemia and Aleukocythemic Leukemia.

Dr. Edward B. Krumbhaar, Philadelphia, Hodgkin's Disease.

Dr. Louis K. Diamond, Boston, The Erythroblastic Anemias.

Dr. Edwin E. Osgood, Portland, Marrow Cultures.

Dr. Charles A. Doan, Columbus, The Reticulo-Endothelial System.

Prof. Hal Downey, Minneapolis, Infectious Mononucleosis.

Dr. Paul Reznikoff, New York, Polycythemia.

Physicians and others who are interested are cordially invited. A detailed program may be obtained by addressing Dr. Ovid O. Meyer, Chairman of Program Committee, University of Wisconsin Medical School, Madison, Wisconsin.

CALL FOR THE CONVENTION FOR THE REVISION OF THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA TO BE HELD AT WASHINGTON, D. C., BEGINNING MAY 14, 1940

May 1, 1939

In compliance with the provisions of the Constitution and By-Laws of the United States Pharmacopœial Convention, I hereby invite the several bodies entitled under the Constitution to representation therein to appoint three delegates and three alternates to the Convention for the Revision of the Pharmacopœia of the United States of America, which is to meet in Washington, D. C., on May 14, 1940.

WALTER A. BASTEDO, M.D.,
President of the United States Pharmacopœial Convention.

The Laboratory and Pharmaceutical Devision, Corning Glass Works, Corning, New York, has recently published a manual "Laboratory Glass Blowing with 'PYREX' brand Glass".

This manual is offered as an aid to the laboratory technician. The manual will be supplied without charge, upon request.

Ohio

The following program was presented by the Ohio Society of Medical Technologists at their sixth annual meeting, April 12th, 1939, Columbus, Ohio.

Registration: Wednesday morning, April 12th, 10:00 A. M., Assembly Floor.

Wednesday Afternoon: Technologists' Luncheon. 11:30 to 1:30.

12:30 to 1:30—"The Technical Basis for Modern Hematologic Interpretations," Charles A. Doan, M.D., Professor of Medicine, Ohio State University, Columbus, Ohio.

1:30 to 2:30—Business Meeting.

Open Business Session—Presiding: Florence Pray, President of Ohio Society of Medical Technologists.

Report of President: Florence Pray, M.T.

Report of Secretary: Betty Solliday, M.T.

Report of Treasurer: Velma Hellerstein, M.T.

Election of Officers.

2:30 to 2:50—"Recent Methods of Pneumococcus Typing," Mrs. Ada Bacon, Memorial Hospital, Fremont, Ohio.

3:00 to 3:30—Round Table: August H. Schade, M.D., Patholo- Robinwood Hospital, Toledo, Ohio.

3:45 to 4:15—"Discussion of the Carbon Dioxide Determination in Blood," Howard W. Robinson, M.D., Member of the Children's Hospital Research Foundation, Cincinnati, Ohio.

4:15 to 4:30—Meeting Closed.

Wednesday Evening, April 12th, 1939—Convention Banquet.

Officers—President, Florence Pray, M.T., Mercy Hospital, Toledo, Ohio; Vice-President, Marjorie Weir, M.T., Mercy Hospital, Canton, Ohio; Secretary, Betty M. Solliday, M.T., 225 Michigan Street, Toledo, Ohio; Treasurer, Velma Hellerstein, M.T., Coroner's Office, Cleveland, Ohio; Chairman of Program Committee, Mr. G. W. Garst, Memorial Hospital, Fremont, Ohio.

Kentucky

The Louisville Society of Medical Technologists announces the following newly elected officers: President, Oscar M. Alton, M.T.; Vice-President, Sister Joseph Maria (Cambron), M.T.; Secretary, Carolyn Weitzel, M.T.; Treasurer, Florence Mattingly, M.T.

Minnesota

The Minnesota Society of Medical Technologists have presented the first issue, Vo. I, No. 1, of their publication, "Minnesota Medical Technologist." The editor of this publication is Dorothy Wilkins, M.T., of Duluth, and assistant editor, Frieda Claussen, M.T., of St. Paul.

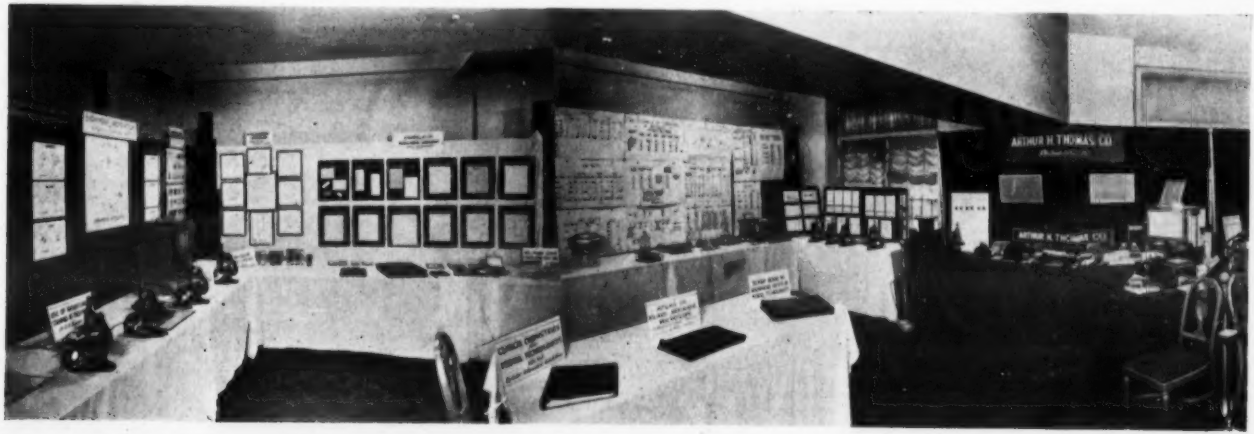
On May 26th and 27th, the Minnesota Society of Medical Technologists held their convention in St. Paul. The program was as follows:

Friday A. M.—The All Star Program
Noon Luncheon with Allied Organizations.

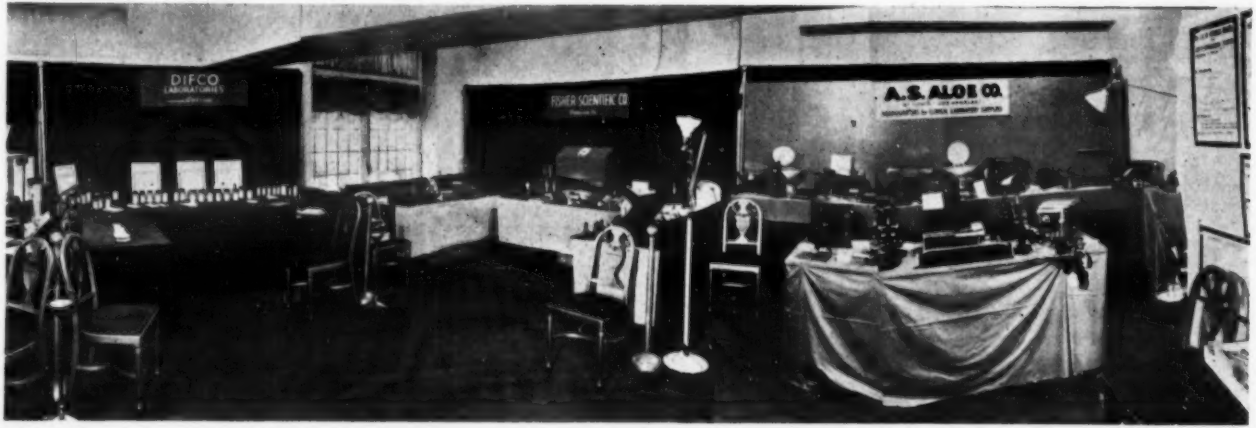
Friday, P. M.—2:00—Business Meeting.
Election of Officers.
Presidential Address.
Welcoming Address—Dr. Wm. O'Brien.
Bacteriology—A. Evenson.
Greetings from Registry—Dr. Kano Ikeda.
Hematology—Mr. C. Winbigler.
Round Table Discussion—Twin City Pathology.

Friday Evening—Banquet.

Saturday A. M.—Open House at Ancker Hospital Laboratory.
Exhibits.



EXHIBITS—ST. LOUIS SESSION, MAY, 1939



EXHIBITS—ST. LOUIS SESSION, MAY, 1939

(Publication of the American Society of Medical Technologists—Incorporated in Michigan)

STATEMENT OF RECORDED CASH RECEIPTS AND OF DISBURSEMENTS FOR THE YEAR ENDED APRIL 30, 1939

RECEIPTS:		
Advertising sales (less commission allowed for agency contract, $22.50)	$1,649.50	
Subscriptions (less discounts allowed for agency subscriptions, $5.21)	577.29	
Commissions earned	12.75	
Collection of account receivable at April 30, 1938	15.00	
Total Receipts		$1,654.54
DISBURSEMENTS:		
Publication costs — Payments to printer	$1,258.76	
Publication mailing and general and return postage	95.35	
Commission paid to advertising manager	132.84	
Bank service charges	12.95	
Envelopes and Stationery	14.50	
Typewriter repairs	1.90	
Advertising in Journal of Missouri Society of Medical Technology	3.00	
Payments to Mr. J. H. Conlin, Editor, for advances made prior to April 30, 1938	.37	
Total disbursements		$1,519.67
EXCESS OF RECORDED RECEIPTS OVER DISBURSEMENTS		$ 134.87
CASH BALANCE, MAY 1, 1938		129.51
CASH BALANCE, APRIL 30, 1939		$ 264.38